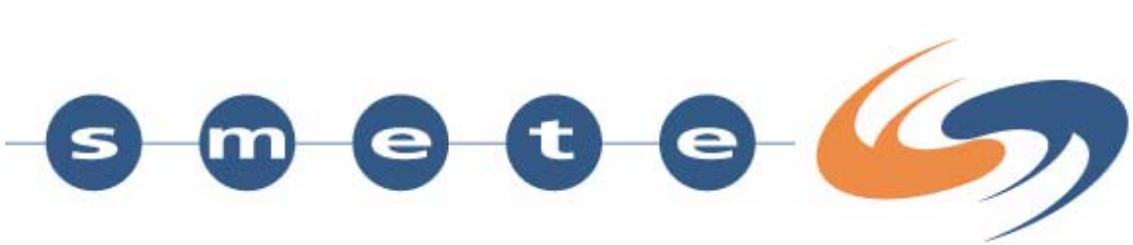

CONNECTING
Science
Mathematics
Engineering
Technology
Education

Building the SMETE.ORG Alliance

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Outline

- **Working Assumptions**
- **SMETE.ORG Vision**
  - Commitment and Philosophy
- **Developing the Organization**
- **Making Everything Work Together**
  - Interoperability and Federated Search

Working Assumptions

- **To build a successful NSDL for deployment in Fall 2002…**
  - To focus on science, mathematics, engineering and technology
  - And more important, it focuses on *education*
- **…we needed to develop a team…**
  - To overcome the challenges we face in developing a NSDL
  - To cover target audiences and disciplines
  - To share in the development efforts

SMETE.ORG Vision

A Digital Learning Community

SMETE.ORG, An Alliance of over 20 partners

- Collections of science, mathematics, engineering and technology learning resources
- Networked distribution of pedagogical material providing seamless access through a tightly coupled federation of educational digital libraries
- Promotes education reform through participatory communities of learners

Commitment

- **SMETE.ORG Alliance Partners are committed to providing a service…**
  - to the nation
  - to support *learning*
  - across disciplines in science, mathematics, engineering and technology
  - in support of education reform and cross-disciplinary learning
  - from K-12 to higher education to professional development and lifelong learning
  - is standards-based & supports the NSDL Program

Development Philosophy

- **The difference is *learning*, not just bibliographic information retrieval**
  - Teaching and learning require something more
- **Guided by *user needs* and philosophy of education that is constructivist**
- **Link content to community and services**
- **Build integrative tools and incorporate "best of breed" tools from partners**

Information Architecture Design Principles

- **Principle 1: Information Organization**

  Organize information to provide opportunities for students and educators to *create, synthesize, manipulate or debate* content rather than merely to passively receive instruction.

- **Principle 2: Information Labeling**

  Label resources with *pedagogical identifiers* such as age group, teaching method, and academic standards to indicate educational uses.

More Design Principles

- **Principle 3: Information Navigation**

  Guide the collection and adaptation of learning elements towards individual learning goals.

- **Principle 4: Information Search**

  Optimize search to meet the *interests, knowledge, understanding, abilities, and experiences* of the users in their roles as educators or students.

Developing the Organization

- **SMETE.ORG Alliance…**
  - Evolving over time
  - Balancing the diversity, history, needs and strengths of each organization
  - Developing partnerships and affiliations to strengthen the whole

- **…partners identify with SMETE.ORG**

Alliance Partners

American Association for the Advancement of Science (www.aaas.org)

BioQUEST Curriculum Consortium (www.bioquest.org)

Coalition for Networked Information (www.cni.org)

Digital Library for Earth Systems Education (www.dlese.org)

Eisenhower National Clearinghouse for Mathematics and Science Education (www.enc.org)

Interactive University (iu.berkeley.edu)

Mathematics Association of America (www.mathdl.org and www.maa.org)

Math Forum (www.mathforum.com)

National Action Council for Minorities in Engineering (www.nacme.org)

NEEDS—National Engineering Education Delivery System (www.needs.org)

Project Kaleidoscope (www.pkal.org)

SRI International, Center for Technology in Learning (www.cilt.org and www.escot.org)

University of California Teaching and Learning with Technology Center (www.ucop.edu/acadinit/tltc)

University of Maryland Baltimore County (www.umbc.edu/engineering/me/wood.html)

Utah State University (ia.usu.edu)

Industry

Cisco Systems (www.cisco.com)

John Wiley & Sons (www.wiley.com)

Texas Instruments (www.ti.com)

Eduprise (www.eduprise.com)

Sun Microsystems (www.sun.com)

WebCT (www.webct.com)

Collaborators

Biology Education Online/Access Excellence & National Assoc. Biology Teachers (www.accessexcellence.org and www.nabt.org)

Columbia University (www.earthscape.org)

Cornell University (www.siteforscience.org)

MERLOT (www.merlot.org)

TeacherLib/MERIT Network and Michigan Teacher Network (www.merit.edu)

University of Missouri Columbia (cecssrv1.cecs.missouri.edu/NSDLProject)

Strengths of Partners

- **Partners with existing collections each have a decade of experience providing digital SMETE resources to their target audiences and disciplines**
  - ENC, NEEDS, Math Forum, BioQUEST
- **Most partners each have more than ten years of experience as organizations promoting SMETE reform**
  - AAAS, Project Kaleidoscope, NACME, Mathematical Association of America, SRI International

Strengths of Partners (cont.)

- **Collections and service providers range from well established collections to incipient collections**
- **Organizations serve full spectrum of audiences**
  - K–12, pre-College, community colleges, liberal arts colleges and universities, public and private research universities, and professional societies
  - Extended affiliations include professional development organizations

Organizational Models

- **Various models at work in SMETE.ORG**
  - **Individual partners make new partnerships**
    - **Ex., ENC's partnership with the Education Development Center (professional development collection) or International Technology Education Association ("T"echnology collection)**
  - **The Alliance adds new partners**
    - **Ex., MERLOT**
  - **Individual partners/projects are themselves a partnership**
    - **Ex., Biosci Ed Net Collaborative, led by AAAS**

Making it All Work

- **What do we mean by interoperability?**
  - We want to provide “seamless access to collections and services”
    - Existing and new collections
    - Existing and new services
  - We recognize there are different types of agreements necessary to provide “seamless access”
    - Social
    - Technical

Social Aspects of Interoperability

- **Agree to interoperate**
  - Shared principles
  - Shared understanding of the issues
- **Build an identity**
- **Meet to develop common language and technical protocols**

Technical Aspects of Interoperability

- **Agree to common methods of representing information**

- **Agree to common methods for transmitting information**

Technical Aspects of Interoperability

- **Agree to common methods of representing information**
  - Common metadata to help organize and describe collections
  - Common thesauri/controlled vocabularies to describe resources in consistent manner across collections
- **Agree to common methods for transmitting information**
  - Protocols/specifications/API's for shared access to contents of collections and services

Federated Search

- **Working definition: Ability to search contents of one collection from another collection**
- **Common database of records**
  - Pointers to either external or internal content
  - Could be cataloged in a single location
  - Could be “contributed” or “harvested” (OAI model)
- **Separate databases with a search gateway**
  - Could search contents of all collections at once
  - Could potentially search from any location to any location
- **Might be multiple types**

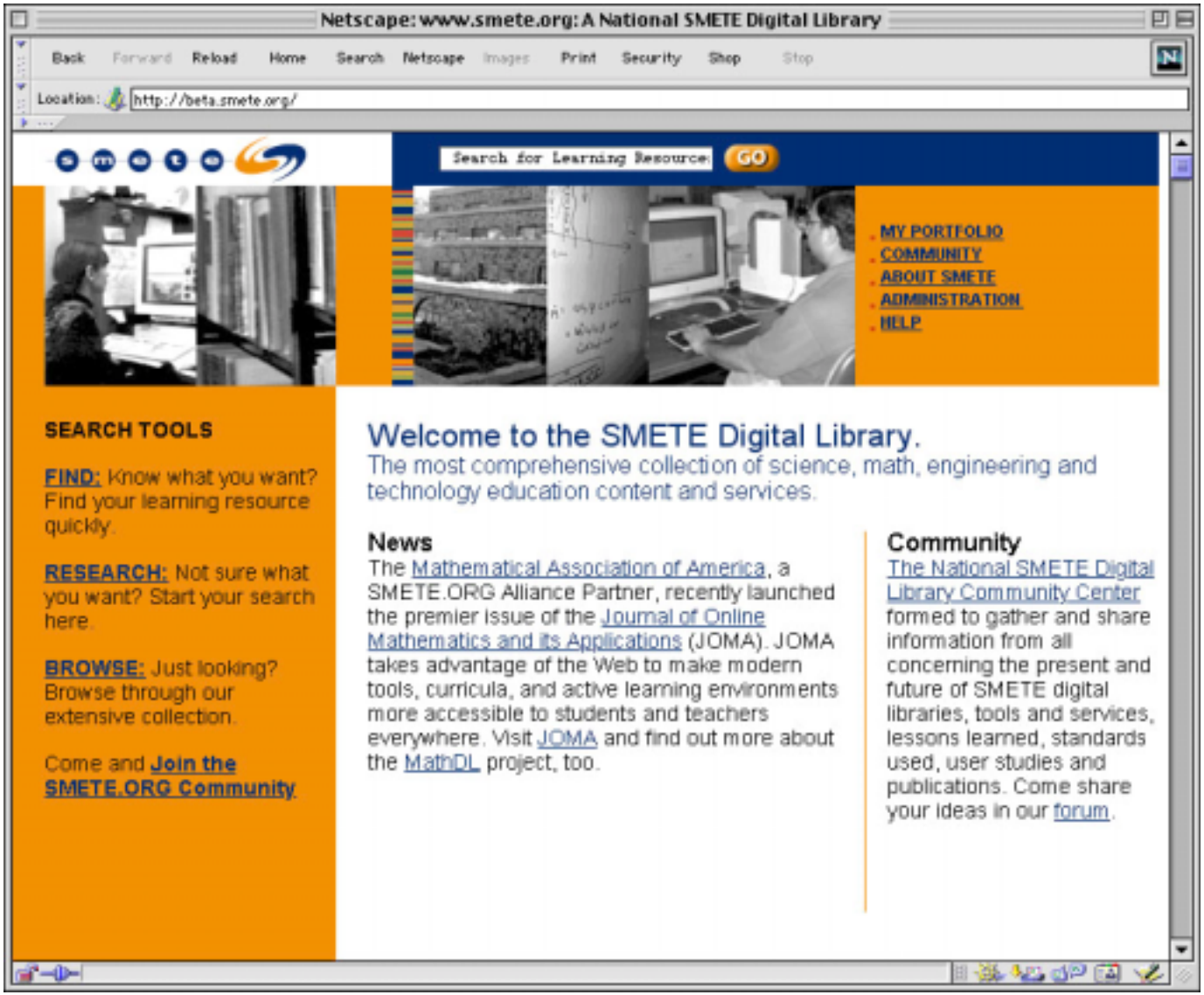
Federated Search and SMETE.ORG

- **Approach values independence of collection partners**
  - Will enable search from any partner collection to any other partner collection
- **Is a multi-tier approach:**
  - Working specification issued, initially using http post and name/value pairs
  - Moving toward more formal protocol for learning resources based on SDLIP
  - Using a prototype Z39.50 (and OAI) gateway to link in “primary” resources from traditional libraries

Other Areas of Interoperability

- **Shared User Profiles**
  - Could be a common user profile registry
  - Will have to handle authentication
  - Will probably interface with a digital rights management system
- **Shared Reviews**
  - Could work in similar fashion to learning resources and federated search

Portal at www.smete.org



Key Features of SMETE.ORG

- **Search for learning resources**
  - Three mechanisms, find, research and browse, aimed at levels of knowledge of catalog metadata
  - Locally cataloged collections
  - Partner collections through federated search mechanism
  - Books and journal articles thru Z39.50 gateway (also OAI Gateway)
  - Receive recommendations to learning resources through collaborative filtering system
- **Form a community**
  - Find persons with similar educational goals through people recommender service
  - Participate in online workshops and focus groups
  - Form ad-hoc communities organized around learning resources and user-initiated discussion topics
  - Review and comment on use of learning resources

Contacting SMETE.ORG

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